2A Low Dropout Regulator

Features

- **Fixed Output Voltage 1.2V, 1.5V, 1.8V and 2.5V**
- **Over Current and Over Temperature Protection**
- **Output Current 2A**
- **16µA Quiescent Current in Shutdown**
- **TO-263 Package**

Applications

- **Battery Powered Systems**
- **Motherboards**
- **Peripheral Cards**
- **Network Cards**
- **Set Top Boxes**
- **Notebook Computers**

General Description

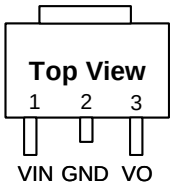
The G954 is a high performance positive voltage regulator designed for use in applications requiring very low dropout voltage at up to 2 Amps. Since it has superior dropout characteristics compared with regular LDOs, it can be used to supply 2.5V on motherboards or 1.5V, 1.8V on peripheral cards from the power supply thus allowing the elimination of costly heatsinks. The G954 provides excellent regulation over variations in line, load and temperature. It provides over current and over temperature protection functions.

The G954 is available with 1.2V, 1.5V, 1.8V, 2.5V and adjustable outputs in TO-263 package.

ORDER NUMBER	MARKING	VOLTAGE	TEMP. RANGE	PACKAGE (Pb free)
G954-12T55U	G954-12	1.2V	-40°C ~ +85°C	TO-263
G954-15T55U	G954-15	1.5V	-40°C ~ +85°C	TO-263
G954-18T55U	G954-18	1.8V	-40°C ~ +85°C	TO-263
G954-25T55U	G954-25	2.5V	-40°C ~ +85°C	TO-263

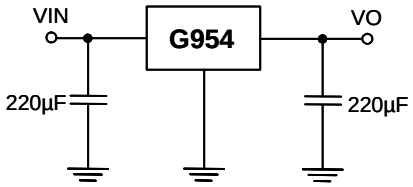
Note: T5:TO-263
5: Bonding Code
U: Tape & Reel

Pin Configuration



TO-263

Typical Application Circuit



Absolute Maximum Ratings (Note 1)

Input Voltage. 7V
Power Dissipation Internally Limited (Note 2)
Maximum Junction Temperature. . . . . 150°C
Storage Temperature Range. . . . -65°C ≤T_J ≤ +150°C
Reflow Temperature (soldering, 10sec) . . . . . .260°C
Thermal Resistance Junction to Ambient, (θ_{JA})
TO-263[1] . . . . . .92°C/W
Thermal Resistance Junction to Case, (θ_{Jc})
TO-263. . . . . .6°C/W
ESD Rating (Human Body Model) 2kV

Operation Conditions (Note 1)

Input Voltage . . . . . 2.2V ~5.5V
Temperature Range . . . . . .-40°C ≤T_A ≤ +85°C

Note [1]: See Recommended Minimum Footprint

Electrical Characteristics

V_{IN} = 5V, I_O = 0.5A, C_{IN} = C_{OUT} = 220µF, T_A = T_J = 25°C unless otherwise specified (Note 3)

PARAMETER	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
Supply Voltage	V_{IN}		2.2	---	5.5	V
Output Voltage	V_O	V_{IN} = V_O +0.7V, I_O = 10mA	-2	V_O	2	%
Line Regulation		V_O+0.7V ≤ V_{IN} ≤ 5.5V, I_O = 10mA	---	0.2	2	%
Load Regulation		G954-12 V_{IN} = 2.5V, 10mA ≤ I_{OUT} ≤ 2A	---	1	2	%
		G954-15 V_{IN} = 2.5V, 10mA ≤ I_{OUT} ≤ 2A				
		G954-18 V_{IN} = 3.8V, 10mA ≤ I_{OUT} ≤ 2A				
		G954-25 V_{IN} = 5V, 10mA ≤ I_{OUT} ≤ 2A				
Quiescent Current	I_Q	V_{IN} = 5V	---	2.7	4.5	mA
Ripple Rejection		fi = 120Hz, 1V_{P-P}, I_O = 100mA	---	55	---	dB
Dropout Voltage	V_D	G954-15 ΔV_{OUT} = 2%, I_{OUT} = 2A	---	0.9	1.1	V
		G954-18 ΔV_{OUT} = 2%, I_{OUT} = 2A	---	0.7	0.9	
		G954-25 ΔV_{OUT} = 2%, I_{OUT} = 2A	---	0.5	0.7	
Short Circuit Current			---	1	---	A
Over Temperature			---	150	---	°C

Note 1: Absolute Maximum Ratings are limits beyond which damage to the device may occur. Operating Conditions are conditions under which the device functions but the specifications might not be guaranteed. For guaranteed specifications and test conditions see the Electrical Characteristics.

Note2: The maximum power dissipation is a function of the maximum junction temperature, T_{Jmax} ; total thermal resistance, θ_{JA}, and ambient temperature T_A. The maximum allowable power dissipation at any ambient temperature is (T_{jmax}-T_A) / θ_{JA}. If this dissipation is exceeded, the die temperature will rise above 150°C and IC will go into thermal shutdown.

Note3: Low duty pulse techniques are used during test to maintain junction temperature as close to ambient as possible.

Definitions

Dropout Voltage

The input/output voltage differential at which the regulator output no longer maintains regulation against further reductions in input voltage. Measured when the output drops 2% below its nominal value, dropout voltage is affected by junction temperature, load current and minimum input supply requirements.

Line Regulation

The change in output voltage for a change in input voltage. The measurement is made under conditions of low dissipation or by using pulse techniques such that average chip temperature is not significantly affected.

Load Regulation

The change in output voltage for a change in load current at constant chip temperature. The measurement is made under conditions of low dissipation or by using pulse techniques such that average chip temperature is not significantly affected.

Maximum Power Dissipation

The maximum total device dissipation for which the regulator will operate within specifications.

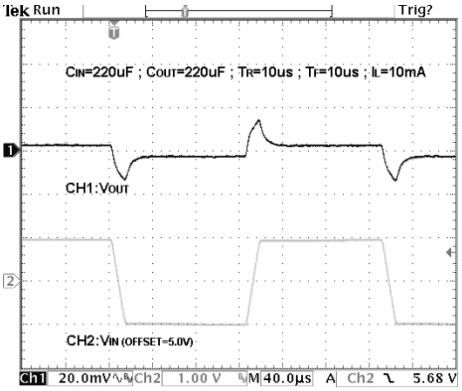
Quiescent Bias Current

Current which is used to operate the regulator chip and is not delivered to the load.

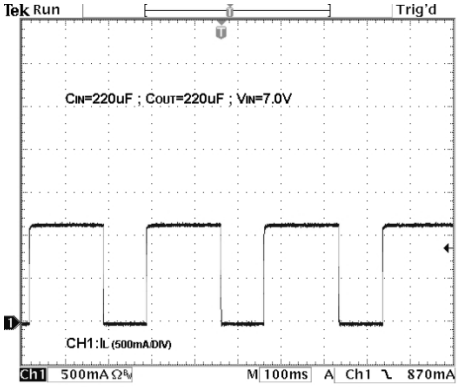
Typical Performance Characteristics

V_{IN}-V_{OUT} =3V, C_{IN} = 220µF, C_{OUT} =220µF, T_A = 25°C, unless otherwise noted.

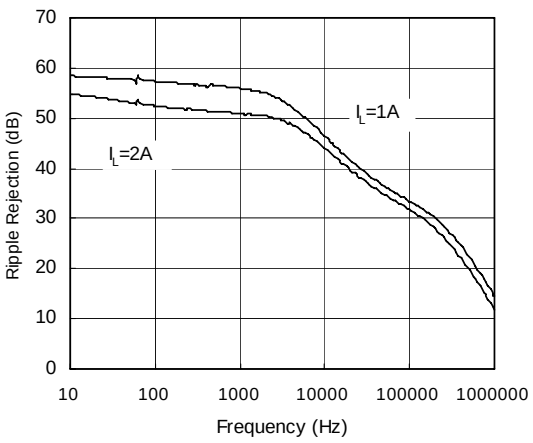
Line Transient Response



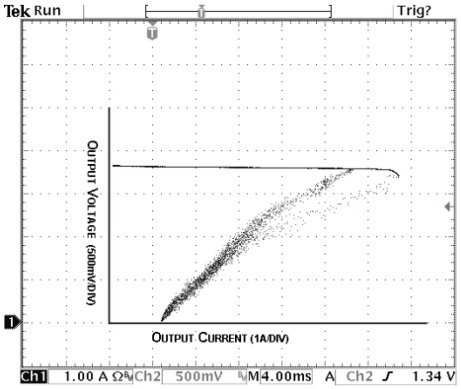
Short Circuit Current



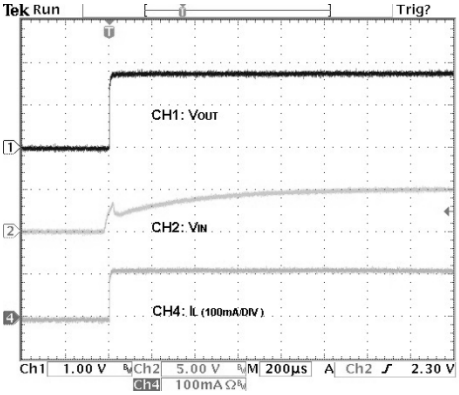
Ripple Rejection



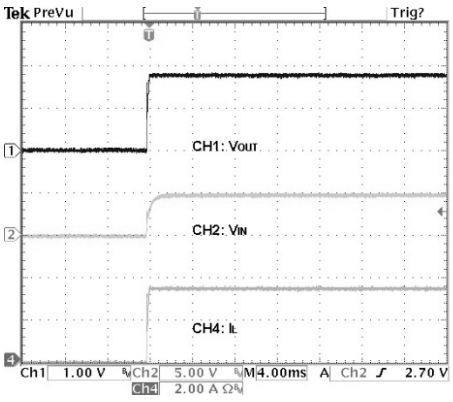
G954-18 Overcurrent Protection Characteristics



G954-18-Start-up

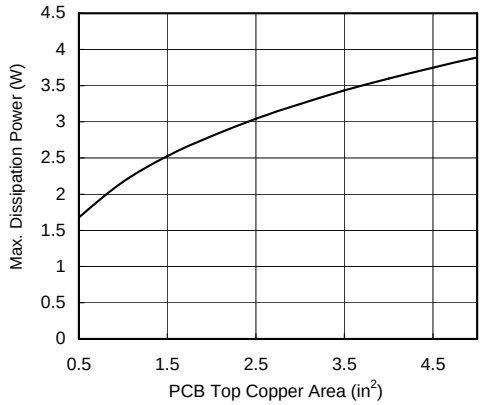


G954-18-Start-up

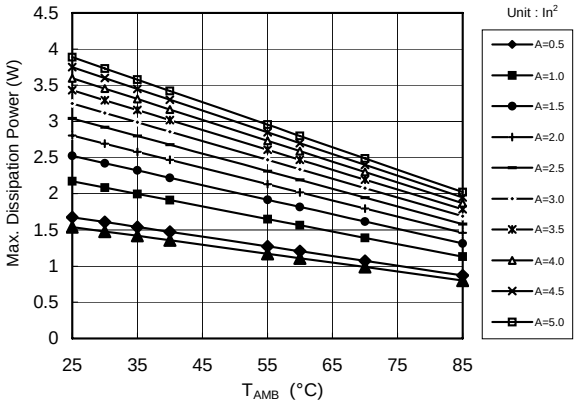


Typical Performance Characteristics (continued)

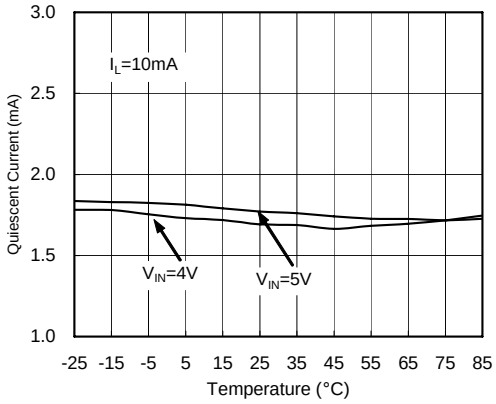
Max. Power Dissipation vs. PCB Top Copper Area



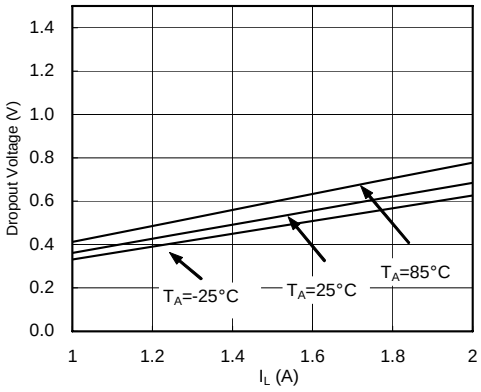
Max. Power Dissipation vs. T_{AMB}



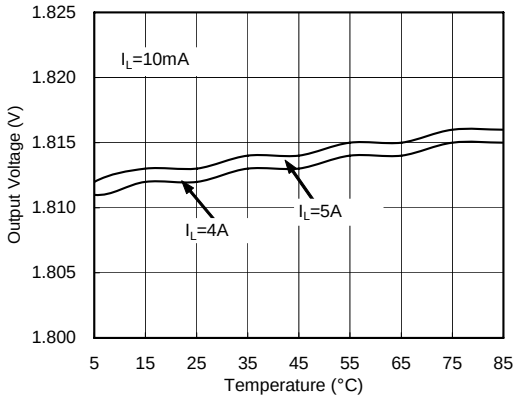
G954-18 Quiescent Current vs. Temperature



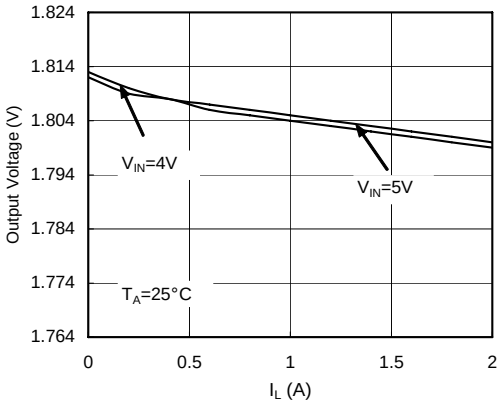
G954-18 Dropout Voltage vs. I_L



G954-18 Output Voltage vs. Temperature

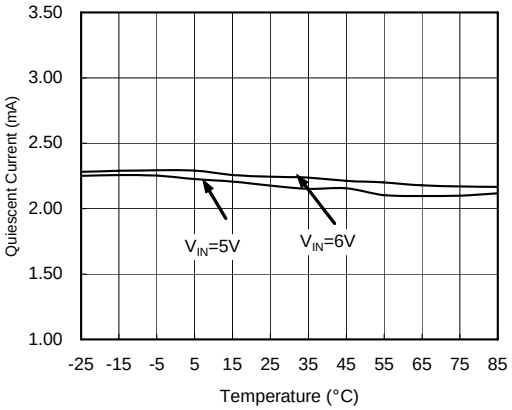


G954-18 Output Voltage vs. I_L

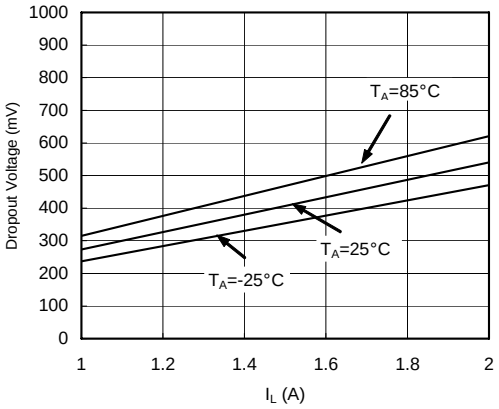


Typical Performance Characteristics (continued)

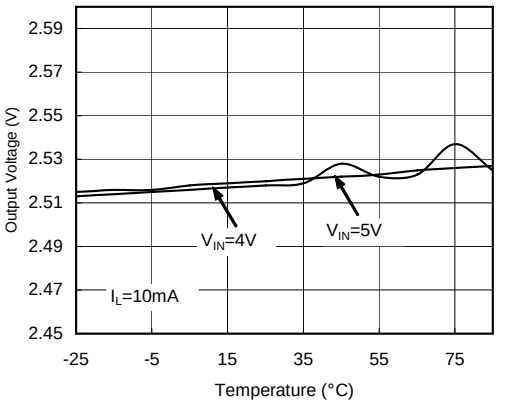
G954-25 Quiescent Current vs. Temperature



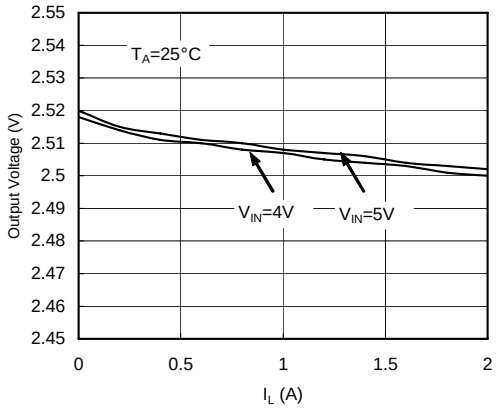
G954-25 Dropout Voltage vs. I_L



G954-25 Output Voltage vs. Temperature

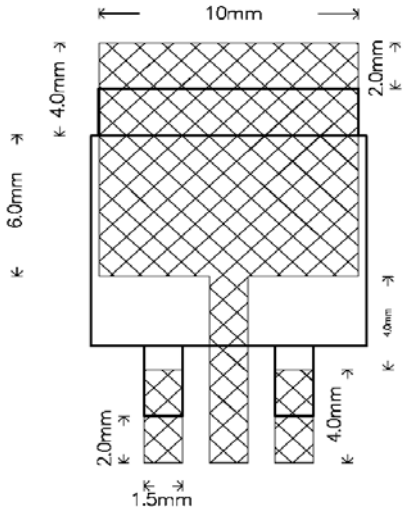


G954-25 Output Voltage vs. I_L

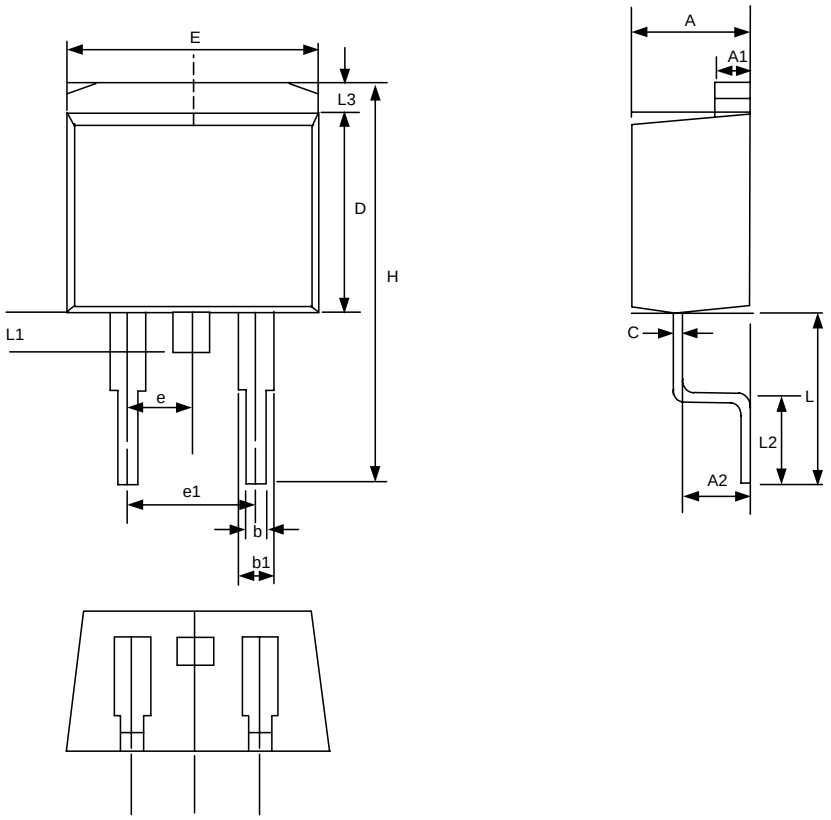


Recommended Minimum Footprint

TO-263



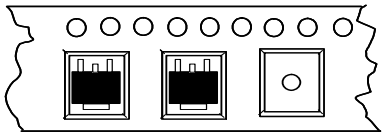
Package Information



TO-263 (T5) Package

SYMBOL	MILLIMETER		INCH	
	MIN	MAX	MIN	MAX
A	4.30	4.70	0.169	0.185
A1	1.22	1.32	0.048	0.055
A2	2.45	2.69	0.104	0.106
b	0.69	0.94	0.027	0.037
b1	1.22	1.40	0.048	0.055
C	0.36	0.56	0.014	0.022
D	8.64	9.652	0.340	0.380
E	9.70	10.54	0.382	0.415
e	2.29	2.79	0.090	0.110
e1	4.83	5.33	0.190	0.210
H	14.60	15.78	0.575	0.625
L	4.70	5.84	0.185	0.230
L1	1.20	1.778	0.047	0.070
L2	2.24	2.84	0.088	0.111
L3	1.40MAX		0.055MAX	

Taping Specification



TO-263 Package Orientation

PACKAGE	Q'TY/REEL
TO-263	800 ea